2. A power supply as recited in claim 1 in which the essentially loss free impedance is an inductor.

3. A power supply as recited in Claim 1 in which the essentially loss free impedance is a capacitor but the source voltage and current are sine waves.

4. A power supply as recited in claim 2 comprising a transformer connected to the mains and said inductor included in its primary or secondary circuits or both, or said inductor consisting of a considerable leakage inductance between the primary and at least one secondary, said load being distributed between said secondaries as needed.

5 A power supply as recited in claim 4 in which the voltage from at least one secondary is rectified by controllable valves and the charge stored in a capacitor, said valves being turned on and off by timing signals from an analog control circuit or a microprocessor so that said secondary performs as said essentially loss free electronic device being able to both sink and source current whereby the control circuit regulates the AC voltage across said secondary within a wide range.

6 A power supply as recited in claim 5 in which a load is also connected in parallel with said capacitor, and in which the DC, Direct Current, voltage across said capacitor and the current to said load are compared to DC reference voltages and regulated by feed back means whereby regulated and adjustable DC voltage and current from zero to maximum is available and AC regulated and adjustable voltage and current from a low value to maximum is available and the respective proportions of DC and AC power selectable as needed.

7 A power supply as recited in claim 6 in which the transformer has a plurality of secondaries, some intended for AC and some to provide DC whereby one DC unit is providing regulation and adjustment causing the others to follow and be regulated and adjusted as well.

8 A power supply as recited in claim 7 in which the controllable valves are mosfets with their switching speed reduced whereby a minimum of noise is caused.

9 A power supply as recited in claim 8 in which the timing sinusoidal signal is reduced to a semi square wave and integrated an even number of times to obtain a delay of 180 ° or a multiple thereof whereby a resulting timing signal will be less influenced by noise from the mains.

10 A power supply as recited in claim 9 in which the resulting time signal has means to create a positive rising waveform comprising approximately 180° and a mirrorlike falling waveform comprising the following 180° so that two timing pulses are available during each cycle.

11 A power supply as recited in claim 10 which has means to limit the timing delay to the first 90 ° of each half cycle.

12 A power supply as recited in claim 11 with means to further limit the range of delay whereby safeguarding against a too low mains voltage.

13 A power supply as recited in claim 12 having means to detect and eliminate down to an acceptable level DC current in the transformer windings whereby preventing saturation of the transformer and destruction of the power supply.

14 A power supply as recited in claim 13 adapted to uninterruptible service by including an oscillator with slightly lower frequency than the mains, a first fast switch to connect and disconnect the mains, a second fast switch to connect and disconnect a battery or other standby power source, and means to operate said switches at the correct times whereby the power supply will automatically switch to standby power in the event of a mains failure and go back to normal operation when the mains returns, the DC voltage from said capacitor being used to recharge the battery if any.

15 A power supply as recited in claim 14 in which four mosfets are used in a bridge whereby the voltage across each mosfet is limited to essentially the DC output voltage.

16 A power supply as recited in claim 15 in which two mosfets are used in a push pull configuration whereby the AC and DC outputs can use the same system ground and the voltage across each mosfet is approximately double the DC voltage.

17 A method of regulating an AC voltage comprising the steps of :

a. supplying an AC utility power having a line frequency;

b. connecting it to a load in series with an inductor;

c. connecting a controllable device in parallel with the load said controllable device being able to essentially loss-free sink and source current;

d. connecting a controller to said controllable device said controller steering the phase and amplitude of the current from and to the controllable device whereby the voltage across the load can be adjusted and regulated.

18 A method of regulating a DC voltage as described in claim 17, wherein said voltage across the regulating device is rectified by mosfet rectifiers and is charging a capacitor in parallel with the load, said controller to be using feed back methods and turning on and turning off the mosfets so that said capacitor is sourcing or sinking current whereby the DC voltage across the capacitor is being controlled and regulated.

19 A method as described in claim 18 supplying simultaneously both regulated and controlled AC and DC

20 A method as described in claim 19 wherein said capacitor is connected with a battery or other DC supply through a mosfet transistor, said controller including an oscillator normally synchronized with the mains but having a slightly lower natural frequency than the mains and driving the mosfet rectifiers also when the mains has dropped out and using the power from the battery or other DC supply whereby the operation is continuing uninterrupted.